DOCUMENT RESUME

ED 148 460 PS 009 609

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TITLE Television, Imaginative Play and Cognitive Development: Some Problems and Possibilities.
PUB DATE Aug 77
NOTE 41p.; Paper presented at the Annual Meeting of the American Psychological Association (85th, San Francisco, California, August 26-30, 1977)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Child Rearing; *Children; *Cognitive Development; *Early Childhood Education; Elementary Education; *Emotional Development; Environmental Influences; Imagination; Parent Education; Preschool Education; *Pretend Play; Television Research; *Television Viewing

ABSTRACT

This paper compares the effects of television viewing to the effects of imaginative play on children's cognitive development. The major developmental tasks which confront the growing child are presented and the significance of imaginative play as a critical feature of the child's cognitive and affective development is discussed. The cognitive properties of the television medium as they may affect the child developing in an environment in which TV is viewed three hours or more a day are then examined. Next, the relevant research relating play or reading as an active process and television as a more passive one are discussed. Finally, approaches to training parents to control children's viewing patterns more effectively and to use TV material to stimulate children's imaginative development are described. (Author/JMB)

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Invited Address, Division of Educational Psychology, American Psychological Association, San Francisco, 1977.

Television, Imaginative Play and Cognitive Development

Some Problems and Possibilities

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Is it possible that the television set now established in well over 95% of homes in the United States may actually be changing human consciousness and the nature of our cognitive development? I put the proposition to you in its boldest form because I think behavioral scientists (along with many intellectuals in the humanities) have preferred to ignore the "idiot box" that sits in the living rooms, bedrooms, or kitchens of millions of homes, peered at for at least three hours daily by millions of children and adults. We are now into the second generation of regular TV-viewers in this country; the fans of Howdie-Doody and Miss Frances, the Mouseketeers, the kids who bought coonskin hats in the millions after watching Daniel Boone are now many of them parents and their children are growing up watching even more television, much of it in vivid color. Behavioral scientists have occasionally decried the amount of violence represented on the 19" screen and have in the past decade begun studying the effects of such material on overt behavior, especially in children. They have paid less attention, on the whole, to other issues concerning the impact of the medium- its

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cognitive implications, its role in forming constructive social attitudes, its potential for educational use, not just in providing information but in enhancing the emergence of cognitive skills that the growing child can draw upon independent of the TV medium for effective adaptation and learning.

Let's not kid outselves--children are growing up today in an environment that includes an element of daily visual stimulation never before a part of human experience. Three and four-year-olds get up at 6:30 A.M. and go over to a little box on which they watch cartoon figures bouncing around or pounding each other into pieces, soon magically revived; by 8:30 A.M. when bundled off to day care center or nursery school they've already watched for at least an hour. At noon if they attend school only for a half-day they're in time for the Gong Show in which miniature adults on the screen also dress in absurd costumes, leap about frenetically or are dragged screaming from a stage in the midst of a caterwauling song. Often well into 9:00 or 10:00 P.M. they continue to watch the movements on the box, usually only vaguely grasping the plots or the meaning of words used or distinguishing between commercials and program content. But the moving figures hold their attention!

Our own current research carried out with about 150 middle-income urban families accords with other surveys of children's viewing patterns in suggesting that very young children are spending about three hours every day of the week before the TV set. For a sizable minority of children in our sample up to half of their waking time when not actually at school may be spent watching TV. In other generations of human history when three or four year olds awoke they perhaps followed their parents around, performed

some household chores and tagged after the adults out into the fields. Or else they read or played. Even with the advent of movies in this century, visits by very young children were occasional, took place with parents or other adults present to some degree, involved a large screen and a very special setting. The radio offered little to hold the attention of the very young child and, for the five or six year old and up, called for an active effort to transform the auditory material into some private visual representations to sustain interest in the plot or characters.

Television is really different, I believe. It's there in the home all the time, its small in size, its figures move and talk and sing and the segments flash by with a rapidity different from the ordinary sequences of real life interactions. A recent book, The Plug-In Drug, by Marie Winn (1977), a professional writer, has provocatively examined the potentially addictive qualities of TV-viewing and has implied that many of our current ills from juvenile violence, the drop in national reading scores or SAT levels, through the increase in drug abuse are attributable to the medium. Ms. Winn may not be technically correct in some of her discussions of cognitive issues or in her hypothesis that the presumed heavier right-brain arousal of television may be weakening the verbal skills associated with left-brain activities. Still, I think she's on the right track in emphasizing the fact that television can encourage a certain kind of cognitive passivity which leads to a "show me or entertain me" orientation by school children or college students and also in her emphasis on the fact that time spent watching TV means less time spent reading or writing or actively exploring

one's environment. I would emphasize even more than she does that the spontaneous play of children involving a mixture of games of mastery, games with rules, exploration and make-believe or symbolic play are all critical phases of how a child learns about itself and its environment, practices verbal skills, tries out various emotional and cognitive discriminations or behaviors, and prepares itself for later social roles through sociodramatic pretending. And children sitting in front of TV sets are obviously playing or reading less than they might have done before the medium was available on so wide a scale.

I've begun with a challenge about some powerful implications of the television-viewing habit for the nature of consciousness. I'd like to examine first of all some of the major developmental tasks that confront the growing child and then to suggest that play (and I am here emphasizing symbolic games, pretending and make-believe) represents a major method by which children can develop the skills required for those tasks. We can then look at television which in a sense represents a form of vicarious play or fantasy and examine some of the special cognitive properties of that medium. We next confront the question of how television-viewing and play are competitive for the child's time and whether there may be ways in which the two forms of experience may complement each other as part of the child's development. What are some of the dangers and limitations in development posed by even moderate TV-viewing (three hours a day for the child)? Ought we to abolish TV entirely as Winn wishfully suggests or can we find ways of using the medium to good effect? What research still needs to be done to help us to move beyond "top-of-the-head" assertions by "authorities"

towards a more systematic comprehension of the way television impacts normal cognitive or social development?

The Task-demands of Growing-Up

In looking at the complexity of the developmental process I think it may be helpful to think of cognitive and emotional growth somewhat in the way an industrial psychologist would look at a personnel selection process. In effect we need a job analysis first. What does it take to grow up into normal adolescence in a given culture or subgroup of a particular society or, in general, in the human species? In effect this is the kind of question specialists like Terrace and Bever (1976) are now posing for the exciting studies of language-training in chimpanzees. Clearly a child by certain age has to master certain motor skills, turning over first, creeping, crawling, pulling itself upright and then standing alone before walking. Some of these performances depend on maturation of musculature and physiology more generally but others are greatly abetted by environmental circumstances. Or, at least, the emergence of the behavior is accelerated by adult aid and encouragement.

For our purposes we shall focus primarily on the task-demands of developing the cognitive and affective systems of the child. For example the child must be prepared with expectations and motor or cognitive "plans" (Miller, Galanter and Pribram 1960) to deal with each new setting or demand. In order to do this it must find a means of transforming externally-derived information into a miniaturized private representational system, rapidly encoded and decoded as situations demand. We have increasing reason to believe that language encoding and the imagery storage processes

are separately organized and processed by the brain (Paivio 1970; Witelson 1976) but that both systems ultimately may interact to produce optimal storage (Rohwer 1970). In imitating language the child gradually miniaturizes sounds, words and eventually phrases into a form suitable for efficient storage and retrieval in the long-term system. The same process presumably occurs with the more global material of visual, auditory or other sensory-modality information and to the extent that the child rehearses images and verbal labels together the chances of highly efficient voluntary retrieval of this material is greatly enhanced.

Piaget (1962) in his emphasis on assimilation and Tomkins (1970) in the theory of miniaturization through repetition are proposing that effective internal representation does depend on some kind of continuing private rehearsal process. I have elsewhere elaborated on these suggestions to propose that make-believe play and pretending in early childhood develop naturally as part of this very process of the child's gaining control over an internal or symbolic representation system (Singer 1973). Pretending and the profound dimension of "as if" in human experience are intrinsic to the establishment of an efficient set of anticipatory guiding images, verbal labels and plans with easily spun-out subroutines. Pretending itself depends on the level of the child's cognitive maturation and also the complexity or "realism" of the structures with which the child is dealing as Fein (1975) has indicated in her experimental analysis of eighteen-month to two-year-olds simulating drinking from an empty cup or feeding a plastic "horsey" with invisible milk.

Although almost all children show some degree of make-believe or fantasy play the persistence and elaboration of such play in the three to six year old period appears to depend upon considerable support and encouragement from adults as well as upon opportunities for practice in privacy (Singer 1973, Singer and Singer 1976a). Obviously children whose play is more limited to games with rules or to mastery experiences such as climbing, ball-playing or forms of motor exploration also master new schema and set up coding systems. But there is increasing reason to believe that those children whose play repertory in the preschool period includes a good deal of make-believe and fantasy play have a distinct edge in certain important cognitive areas (Smilansky 1968). A study by Lewis (1973), for example, found that kindergarteners who played more elaborate and extensive sociodramatic or fantasy games showed better performance in picture interpretation tasks, in the amount of language employed and in organization of language during picture interpretations. In free association tasks high fantasy-play children produced more responses, provided more associations remote from self or the home environment and showed more use of categorization and associative linkage than of random naming. Lewis found her clearest differences in cognitive organization between the children of High IQ-High Sociodramatic Play and those with correspondingly High IQ and Low levels of fantasy play thus ruling out sheer intelligence as a factor in the differences. Similar results have been reported recently by Dansky (1976) and in a series of studies summarized by Singer (1977).

Our own current research on three and four year olds as well as several

earlier studies using observation of free play have consistently found correlations between levels of make-believe and the use of more extended vocabulary (Singer, Caldeira & Singer, 1977) or the introduction of more complex syntactic structures such as predicate nominatives into spontaneous language. An as yet unpublished report by Corrine Hutt in England also suggests that working class children whose spontaneous language is characterized by little variation and complexity show an increase in measures such as Mean Length of Utterance and richness of vocabulary when encouraged to engage in make-believe games. The continuing reports by Saltz (1976) on urban disadvantaged children trained in thematic play are also corroborative here.

I am suggesting, then, that growing up requires an increasing complexity of vocabulary, an ability to categorize materials, to retrieve words or images readily and to generate sets of more remote associations or to recall details of verbally presented situations accurately (Tucker 1975). Imaginative play provides an arena for rehearsing material, assimilating it to a greater variety of preestablished schema and by the very process of scaling it down in the form of toys or small objects standing for large ones (as in blocks for buildings or pencils for airplanes), miniaturizing the material for more effective later retrieval.

Let me briefly talk of the task-demands for the growing child in the affective area. There is increasing reason to believe that human beings grow up with a relatively differentiated but circumscribed affect system closely tied to facial representation and to the complexity of and rate of assimilability of information processing demands (Tomkins 1962, 1963;

Izard 1977). An important feature of pretend play is that it again provides opportunities for expression and control of affect and the representation in miniaturized form of conflictual or frightening scenes or encounters. The child engaged in pretend play of adventurous or hostile encounters gains some sense of competence and power (Sutton-Smith 1976) or empathy (Gould 1972; Saltz and Johnson 1974) and may in effect be establishing better organized schema or plans and subroutines for observing others' emotions and expressing or controlling its own. In our own research we have regularly observed that children engaged in make-believe play are also "happier" children. That is, when observers rate them for the positive affects of interest and curiosity or joy and the smiling response we find positive consistent correlations between imaginativeness of play, positive affect, concentration, elation and cooperation with peers (Singer and Singer 1976a).

Important task-demands of socialization and moral growth also confront the child. Differentiating aggression or violence from adaptive assertiveness, impulsivity from means-end action, egocentricism from sharing, dependent demanding from sharing or helping, infantile sexuality from interpersonal intimacy--all these are demands we all must confront in the growth process. Make-believe play as child psychotherapists have long stressed is an important arena in which children can express and differentiate issues of this kind. Again, in a sense, the play situation permits the child to examine an array of probabilities or possibilities with impunity and to store these miniaturized new schema more effectively. Gould (1972) on the basis of her observations of free play in preschoolers concluded that children who played more

imaginatively also took roles other than self in play and thus developed an empathy for the victims of aggression. They were thus less likely to be directly aggressive towards others. There is a body of evidence that suggests that by elementary school age children who show imaginativeness in spontaneous play or in projective test performance are less likely to be overtly aggressive or impulsive and are better able to tolerate delays or are more socially cooperative (Singer and Singer 1976b). In our current research as well as in earlier studies (Mahme-Huang, Singer, Singer, and Wheaton 1977; Singer, Singer, Tower and Biggs 1977) we have generally found that imaginative play is also associated with peer group sharing or cooperation and with somewhat less demandingness or dependency on adults. Rubin, Maioni and Hornung (1976) also report data suggesting a greater level of social maturity identified with sociodramatic play.

In summary, then, imaginative play can be viewed as a major resource by which children can cope immediately with the cognitive, affective and social demands of growing up. It is more than a reactive behavior, however, for it provides a practice ground for organizing new schema and for transforming and storing material for more effective later expression in plans, action or verbalization. Our own research and the increasing body of studies in this area suggest that play is an active process and one that depends to some degree on reinforcement, modeling and general encouragement by parental figures (Singer 1977, Dennis 1976, Shmukler 1977 and Gershowitz 1974).

A critical question that remains before us is to identify even more precisely those factors which are particularly conducive to encouraging

imaginative play in early childhood so that such play can be effective in helping the child develop further its cognitive, affective and social skills. Gershowitz (1974) demonstrated that well-trained or empathic adults who offered direction initially to a child and then pulled back were more likely to foster rich imaginative play in the youngsters. Shmukler (1977) has been carrying out an elaborate study of mother-child interaction patterns in relation to make-believe play and imagination with middle-class white parents in South Africa. In a sophisticated Boolean analysis of relevant variables she finds evidence that a variable reflecting a mother who tells stories to a child, is accepting of the child's uniqueness, and who shows leadership in stimulating play but then withdraws are the best predictors of imaginativeness.

A recent example of maternal input and its impact on a child's developing imagination can be cited. In an article on new developments in philosophy Branch (1977) describes the childhood of Sol Kripke, an outstanding young American logician. Kripke's mother used to recite Gilbert and Sullivan passages to him when he was a preschooler. Subsequently intrigued by the word play of that delightful material the boy developed a whole world of gremlins, an absolute monarchy whose king was both the tallest and the shortest character in the realm. He used to delight his younger sisters with running episodes of this fantasy. The progression towards analytic philosophy and the complex word-play and mathematics of Kripke's examination of "truth" seems less surprising with such beginnings.

The Special Qualities of the Television Medium

Let us return now to examine where television fits into our job

analysis of the child's cognitive and affective development. If play is as important as I have suggested it may be then where does watching television fit into the child's repertory? It might be argued that television represents an important, easily accessible alternative to parental story-telling and subsequent spontaneous play. Indeed for many poor children whose parents are overworked, inaccessible or lack a cultural orientation to engage in story-telling or reading to children it is possible that television affords a remarkable opportunity to come in contact with magic, fantasy, a richer vocabulary, and much information about other countries or about history and culture not ordinarily available to them. If one accepts some form of the psychoanalytic catharsis theory in which vicarious experience in the form of fairy tales or myths involving symbolic representation of crises of early childhood, e.g., incest, parent-directed violence or sibling hatred can alleviate conflicts over sexuality and aggression (Bettelheim 1975) then television may be serving as good or better a function for the broader society than bedtime stories ever could.

The fact is we don't yet know enough to assert the positive or negative evidence for the proposition that television may be providing a major form of alternative consciousness or that it may be serving much the same role as play in child development. Our present research in which we are tracking three and four year olds over a year or more and looking at relations between how much and what they watch on TV and their spontaneous play activities during the nursery school day is just a beginning in this direction. It is certainly clear from recording their make-believe play

or from identifying their imaginary companions that a large percentage of their fantasy figures are drawn from TV characters especially Batman, Superman, Bionic Man, Wonder Woman and Bionic Woman. The pull of the powerful figure is a strong one for even from Sesame Street our children are far more likely to adopt the Cookie Monster as a make-believe character than some of the more benign moppets on the show.

It can be argued, however, that television may be counter-productive to the development of imagination as a basic resource for the growing child. Of course it preempts time from spontaneous play as it obviously does for reading in the school age child. While three or four-year-olds do indeed view the set with far less attention than older children and often drift into spontaneous play as our own studies indicate, play while the set is on is desultory and more fragmented. Television as a stimulus situation has special properties that require very careful examination (Singer, in press).

1. Attention-demand

It is almost impossible to ignore a TV set if you are in the same room even if the sound is turned off and only the picture visible. The human brain has evolved to respond to movements in the environment, no doubt a basically adaptive mechanism. The activity in the little box across the room is continuous but not rhythmic--new faces or settings appear from moment to moment and evoke an orienting response from us. The rapidity of changes has been studied by the staff of the Children's Television Workshop in developing the Sesame Street format and it

was possible to show (by use of a competing stimulus) that quick black-outs, lively movement and pixillation hold the eyes of preschoolers on the screen with remarkable success (Lesser 1974). In our own research in which we compared three and four-year-olds reactions to the slow-paced Mister Rogers with the lively, quick-cut Sesame Street it was obvious that the latter show kept the children concentrating on the screen more consistently (Singer, Singer, Tower and Biggs 1977).

We need considerable research to determine whether the attention-attracting qualities of TV do present a psychological problem, indeed an addictive potential as Winn (1977) has suggested. Certainly it is much harder to read or to do homework in the same room with a working TV set. Those of us from the radio generation of the 1930s can attest to the great psychological differences between radio-listening and TV-viewing. The former was less likely to interfere with reading or playing; one could periodically blot out some of its impact. The TV set constantly draws us back to it.

2. Brief Sequences

Commercial television in this country has evolved a style of extremely brief sequences of events. An interaction between two people or a depiction of a news event or fictional plot sequence rarely runs beyond a couple minutes without a sharp change of scene or characters. Staying with the face of an individual and slowly "panning" closer, often an artistic touch in film is almost never done on commercial TV because of the fear that the audiences attention will be lost. Commercials, themselves rarely more than 30 seconds long, burst upon the screen tumbling after each

other in breathless profusion after only a few minutes of a news broadcast or story-line.

We have very little understanding of the psychological impact of this experience on the developing cognitive structures of the preschooler. Is life really like this? Can one really comprehend material presented at so rapid a pace? What effect does such frequent change produce upon the viewer?: Frustration, anger and arousal more generally initially perhaps and glazed insensitivity later on. We are really not sure. Certainly there are reasons to believe that the rapidity of sequences can have an arousing quality and may produce hyperactivity in the young child (Halpern 1975) or serve to facilitate aggressive behaviors (Tannenbaum and Zillmann 1975, Watt and Krull 1977). In some of our research we find that only very bright three or four year old girls are able to retain some of the main features of a Sesame Street show just a few minutes after watching it (Singer, Singer, Tower and Biggs 1977). In our current study of preschoolers we find that children who show overt aggressive behavior in nursery school are more likely to be watching not only adult-oriented action-detective shows but also extremely noisy, fast-paced programs like The Gong Show. We cannot yet assert the direction of causality for certain, however.

3. Interference effects

The complete changes of material that follow so closely upon each other in television must certainly have some special impact upon our memory systems. We know that material to be stored even for later recognition must stay within a short-term memory system for a critical few seconds. If material is to be actively retrieved with any efficiency (not just

passively recognized) it usually requires more time in short-term memory or a combination of exposure to the sensory modality with a verbal labeling process and perhaps some few rehearsals in our own private "instant replay" system. The piling up of material with such rapidity in TV may lead to strong interference effects. If I were an advertiser on TV I think I'd prefer one minute or longer spots with much internal repetition of the product name rather than a widely scattered profusion of thirty-second spots.

The issue for the child is whether this rapid succession of novel material may not only interfere with immediate recall or comprehension but also impede the development of the private rehearsal system. For the child to become involved in the assimilation process may demand some vocalization of words or sounds, some motor play, sometimes literally jumping around imitating a behavior sequence represented on the screen. With the demand character of the visual movement and the interference from new material it is conceivable that children do not have a chance to use brief play episodes to transform or miniaturize the content. They may simply not get into the habit of using this mechanism when confronted with the TV set.

If you think about it a great deal of the pleasure of life comes not only in the immediacy of an experience, a fine tasting wine or bread, sexual release, a beautiful bit of melodic phrasing on a piano or guitar. The instance passes rapidly but our memory of it lingers. We savour the great experiences of living and reexperience joy that way. Television moves on too quickly to allow such private activity unless we forcibly

withdraw our eyes from the set or have already developed our imaginative capacities so that we can tune out a moving stimulus in order to daydream a little (Singer, Greenberg and Antrobus, 1971, Rosenberg, 1977). Indeed the TV medium recognizes this problem by providing instant replays of sports events and even in the baseball parks themselves those great fielding plays we might remember for years are quickly shown again on giant screens near the scoreboard. It remains to be seen whether reliance on such external representations may be weakening the child's development of play sequences and private imagery as a basis for enjoyment of experiences and rehearsal or assimilation of novel material.

4. Complexity of television presentations

Television time salesmen often approach advertisers with the slogan that a commercial message on television can reach the consumer through "sight, sound and print!" This implies that these modes of presentation may be mutually reinforcing but there is at least some reason to believe from cognitive research that cross-modality presentation of stimuli can be confusing. If a visual presentation of a concrete image, a loaf of bread for example, is coupled with a printed statement about the bread it is possible that while mentally replaying the visual image we will miss the chance to read or encode the verbal message before it flashes off the screen. Imagine the problem for the preschooler when a "voice-over", a printed message and a visual image of a lively toy all occur together. Needless to say, the mandatory message such as "Batteries not included" or "Each part sold separately" is lost on the child. Later when the toy comes without batteries or a relative brings one Planet of the Apes doll but not the other

cast of characters or accessories portrayed in the commercial there may be tears.

Of course it may be true that the complex vocabulary and rapidity and variety of presentations on TV are actually sharpening the preschoolers quickness to grasp material. Children may learn early to adjust to complexity and benefit from it. Aren't city kids, used to bustle and fast-talking people supposed to be more verbal and quick to grasp communications than their country cousins? In a sense the television medium may have urbanized the nation along fast-talking Madison Avenue lines. Again we need some research to examine whether preschoolers are sharpening vocabulary and speed of comprehension through exposure to TV.

Our own data so far suggest that high frequency TV viewers among our preschoolers are using more nouns and related syntactic structures in their spontaneous speech during play while low frequency viewers are using more verbs and adverbs presumably a slightly more advanced level of language development. A similar result has been reported by Milkovich and Miller (1975) and it would therefore appear as if high viewing is not conducive to more complex vocabulary usage. The studies by Friedlander and Watstone & Scott (1974; 1975) also suggest that children prefer much more slowly paced sequences of information presentation and can comprehend a good deal of material if not burdened with too hectic a pace. Our studies of recall of material from Mister Rogers Neighborhood, a slow-moving, child-oriented program, suggests that the less intelligent child can recall more because of Mister Rogers' soft speech and careful repetition (Singer, Singer, Tower and Biggs 1977). We also noticed that while children's eyes wander from the

set during that show and the youngsters even go off to play they can retain as much or more as children who stay glued to Sesame Street.

5. The Visual Orientation

An obvious reason for the power of television is that it does a great deal of the work for us. Not only are we as humans more sensitive to visual displays just as beagles are more responsive to olfactory ones. We also have the harder task when listening to radio drama of imagining the faces or movements of the characters or conjuring up some kind of mental representation of the exotic setting of a particular adventure. If we are reading we have to perform even more complex transformations from words to auditory or visual imagery. Even the preliterate four or five-year-old who thumbs through a picture book has to fill in movements or extend through some private transformation the static images represented there. TV does the whole thing for us at one fell swoop and all it takes is the flip of a switch.

Visually-presented material does largely appear to be processed more extensively by the right side of our brain in a global, parallel fashion. Printed material or complex verbal or mathematical sequences seem to engage the left side of the brain more. There is some reason to believe (Witelson 1976) that boys are more differentiated in right-left brain function than girls in early childhood. Indeed the verbal advantages girls show (as evident in our own current language analyses as well as in many other studies) and boys greater susceptibility to verbal difficulties such as stuttering or dyslexia may reflect some limitations of this early specialization of brain function. Is it possible that television-viewing which

emphasizes concrete representation and spatial imagery may be playing further into this early limitation in boys' cognitive development? Certainly in our research boys are watching somewhat more than girls and even more as they go from three to four. On weekends we notice that boys are especially likely to be plunked in front of the TV set, perhaps to keep them quiet, while girls are more likely to be off shopping with mother, helping with chores or involved in some kind of play. Clearly we need some more extensive research on the kinds of processing involved in watching TV and some indications of whether or not there are differences in exercise of one or both hemispheres in relation to whether one is reading or watching television. While it is unlikely that TV is turning our left brain to mush as Winn (1977) occasionally seems to suggest, it is possible that the ease of viewing is enhancing a strong preference for or reliance upon global visual representations that makes children and later young adults more impatient with the effort required to process purely auditory verbal material such as a teacher's lecture or deal with reading material.

6. Emphasis on Action and Violence: Emotional Range

I have already mentioned how the rapid sequence format of TV may have an emotionally-arousing effect. It is also the case that TV producers and writers believe they cannot hold an audience's interest or attention without vigorous movements or acts of violence being represented on the screen. The literature on the potential aggression-eliciting or modelling effects of violence need not be reviewed further at this point (Lefkowitz, Eron, Walder & Huesmann 1977). What I should like to stress is that by its very format

American television presents a set of models for vigorous motion that can spill over even in play towards direct aggression. Nursery school teachers complain of Kung Fu chops delivered to unsuspecting playmates, of games of construction involving imaginary cities or factories being disrupted by passive children who topple block structures with shouts of "Earthquake!" or "Towering Inferno!" Imaginative play has always included incidents of adventure and violence within a circumscribed framework but many observers believe today that the larger than life representations and realistic violence of many shows are conducive to imitative behaviors rather than to play transformations.

Another trend of television in its attempt recently at providing equal sex representation has led to the presentation of super-female figures like Bionic Woman or Wonder Woman. Our data indicate that these characters are being adopted by preschool girls as their identification figures or imaginary companions alongside of Superman and Batman. Boys, by the way, do not stray into identification with female superheroes, however. Are the media simply going to resolve sexual inequalities by making woman more violent and potentially antisocial? How about having boys identify more with some of the fine, civilized qualities of woman like tenderness, nurturance, cooperation and aesthetic sensitivity?

I will not discuss some other important aspects of television that require attention as they have been extensively considered elsewhere. These include the excessive materialism and commercial socialization experience provided by U.S. TV, the continuing racial stereotyping (U.S. Civil Rights Commission 1977), the failure to develop extensive children's programming

that can emphasize sharing, cooperation and altruism. My concern is not that we attack television but that we understand it and eventually learn how to use it effectively for optimal cognitive and affective development.

The Power and Limitations of Television

Having looked at some of the special stimulus characteristics of the TV medium we can draw some tentative conclusions about what TV can offer the growing child and also some of the problems it poses for development. First of all I can't avoid the belief, not yet adequately tested by research, that for the masses of poor children around our nation who might in the 19th century have grown up illiterate and vastly ignorant of the world outside their neighborhoods, television is clearly opening vistas of a broader society and introducing a variety vocabulary and language to which they would not ordinarily be exposed. Remember that the data on inverse relationships of language use and TV frequency I cited are from middle-class samples. At least at the level of a recognition vocabulary TV must be doing more for the educationally disadvantaged than any educational system ever available before. If our society is not prepared to spend the money for small classes, intensive high quality formal education for its urban or rural poor then television may be partially filling the gap. It is doing so, I believe, at a cost--it is substituting visual and oral experience for the ultimately more efficient and self-liberating skill of reading.

Television is also providing in its way a new cultural background, a host of archtypes, identification and stereotype figures around which children can organize their imaginative experience. Again this is especially important for masses of children who because of cultural and educational limitations might have grown up semiliterate and minimally exposed to some of the great

that can emphasize sharing, cooperation and altruism. My concern is not that we attack television but that we understand it and eventually learn how to use it effectively for optimal cognitive and affective development.

The Power and Limitations of Television

Having looked at some of the special stimulus characteristics of the TV medium we can draw some tentative conclusions about what TV can offer the growing child and also some of the problems it poses for development. First of all I can't avoid the belief, not yet adequately tested by research, that for the masses of poor children around our nation who might in the 19th century have grown up illiterate and vastly ignorant of the world outside their neighborhoods, television is clearly opening vistas of a broader society and introducing a variety vocabulary and language to which they would not ordinarily be exposed. Remember that the data on inverse relationships of language use and TV frequency I cited are from middle-class samples. At least at the level of a recognition vocabulary TV must be doing more for the educationally disadvantaged than any educational system ever available before. If our society is not prepared to spend the money for small classes, intensive high quality formal education for its urban or rural poor then television may be partially filling the gap. It is doing so, I believe, at a cost--it is substituting visual and oral experience for the ultimately more efficient and self-liberating skill of reading.

Television is also providing in its way a new cultural background, a host of archtypes, identification and stereotype figures around which children can organize their imaginative experience. Again this is especially important for masses of children who because of cultural and educational limitations might have grown up semiliterate and minimally exposed to some of the great

symbols of world literature and art. TV-viewers now know something of Greek mythology, Isis, long buried in Egyptian scholarship reemerges as a heroine on Saturday mornings, Robin Hood, and Sherlock Holmes and Sinbad the Sailor are known to children who might never have looked at a book before. True, our three year olds are identifying with superheroes like Batman or Superman but these are after all only slight transformations of the Hercules and Krishnas with whom millions of children and adults for thousands of years have peopled their imaginations. The danger, as I see it is not so much that pop culture (following Gresham's economic law) will drive out high culture but that the stimulus properties of the TV set may subvert almost completely the enjoyment and hence the practice of reading skills and independent imaginative play.

If TV does provide a "window on the world" (Liebert & Neale 1973), we may well ask, "what world?" There is a broader world out there beyond our immediate experience peopled by Senators, Rhodesians, Chinese ping-pong players, full of erupting volcanoes, oil spills, and forest fires. Some of it may touch or influence us but much of it never will. Do we have to attend every policeman's funeral or have to watch close up the terrible conflicting emotions of Son-of-Sam's anguished father or the grief of the parents of a murdered or drowned child? The work of Gerbner (1977) and his associates suggests that through both fiction and news television presents so terrifying a picture of the world that even moderately frequent viewers grossly overestimate the dangers of their daily life. The visual impact of a tragic occurrence has a vividness that stays in memory while the reading of similar content in a newspaper might make it possible to

qualify the significance of the event and to present it in fuller perspective.

The risk here for young children is not only an exaggerated fear, already documented in several reports, but also, again, the substitution of an external vicarious experience for one the child can control and assimilate. If television stimulates make-believe play then the child can engage in rehearsal processes, miniaturization, and can gain a sense of efficacy that permits a very different mode of storage of the material than is possible only from the gross viewing experience. At least that is a hypothesis worth testing. But the danger is that television-viewing may simply preempt play and, indeed, the habit of play, and remove a resource that could be of great value to the child.

Finally, is television generating an external sensation-oriented consciousness? The ease of access and passivity of the TV viewing experience may be training us to expect such externally generated fantasies. It is indeed possible to show that among college youth those who are especially oriented to seeking stimulation from external sources are most prone to use of hard drugs and hallucinogens (Segal and Singer 1976a, 1976b). The link to heavy television-viewing has not been forged, however, clinical experience does suggest that many young people who are consciously seeking to try new drug sources to stimulate or moderate their emotions are less likely to have developed an extensive private fantasy life and the habit of reading and using such material to stimulate their ongoing thought. Such young people also have a history of almost compulsive TV-

watching with little discrimination.

Controlling and Using the Television Medium

Television is here and it won't go away. It may be impeding the natural playfulness of young children, their reading potential and altering their sense of control of their consciousness. It is obvious that when a human weakness supports a major industry rational criticism of its dangers will not abolish the resource--the history of alcohol, tobacco and gambling make that clear. We need to learn methods for controlling and using the television medium more effectively. Winn (1977) makes some telling points about how parents have increasingly relied on TV to do their work--at least a brood of kids gathered before the TV is quieter on a lazy Saturday morning!

1. Turning off the set

Can we get away with abolishing or sharply restricting TV-viewing for our preschoolers and elementary school kids? A few private nursery schools have tried the experiment, soliciting parental acquiescence for several months. The reports are that imaginative play and creativity by children increased, that violent disruptions of play in school fell off (Winfred, 1977). Systematic research on the consequences of growing up in a television-free environment is not available, however, Shmukler (1977) in Johannesburg has observations on the imaginative play of middle-class preschoolers using the same observational variables and testing procedures as we are employing in New Haven. South Africa has just introduced TV on a very limited scale with just about an hour-and-a-half of rather good

quality children's TV available to her three and four-year-olds. In general her children are showing somewhat higher levels of make-believe play than our sample but of course many other cultural variables may be at work. Within our own sample in our first sets of observations we cannot assert that extremely limited viewing is associated with more imagination or positive affect than very frequent viewing although a trend is evident but overt aggression is clearly more apparent in the behavior of high frequency viewers. Since our study is longitudinal it remains to be seen whether persisting low levels of viewing in preschoolers are associated with increasing imaginativeness of play and limited overt aggressiveness or antisocial behaviors.

2. Controlling the viewing patterns

Getting parents to turn the set off completely seems an unlikely possibility anyway. Our own research includes a training module for certain families in which we present them with information about the risks of television, demonstrate potentially harmful programming and also provide them with practical suggestions on how to limit viewing and direct the children towards programming which has some potential constructive cognitive or social value. In our group meetings we found parents receptive, indeed eager for help in controlling and using TV more effectively with their preschoolers but almost uniformly adamant about turning the set off completely. The next year or more will tell us whether procedures of this kind can be empirically demonstrated to change children's frequency or pattern of viewing and concomitant overt behavior (Singer and Singer 1977a, 1977b). At least

we are building a set of guidelines and a training manual that parent groups or child care workers can use in controlling the excesses of TV-viewing among preschoolers.

3. Using the TV set more effectively

If parents won't turn it off can they take advantage of the TV set more constructively for cognitive and affective growth? The fact is that some television programs are not only entertaining but can be genuinely helpful in the cognitive or emotional development of the child. Our favorite in this respect is Mister Rogers Neighborhood; not only was it developed with great thoughtfulness to communicate to the preschooler but a series of reasonably carefully executed studies attest to its positive impact (Stein, Friedrich and Vondracek 1972; Friedrich and Stein 1975; Coates, Pusser and Goodman 1975; Singer and Singer 1976a, b; Singer, Singer, Tower and Biggs 1977). After watching just a few segments children seem to be more cooperative, helpful, positively reinforcing to others, imaginative in play and less angry, sluggish or aggressive compared with control groups. In our studies we found that the availability of an adult was especially important if a group of preschoolers were watching together (Singer and Singer 1976a, 1976b; Singer Singer, Tower and Biggs 1977). Our current study indicates too that more aggressive children who are also generally high-frequency TV-viewers are much less likely to be watching Mister Rogers Neighborhood than are children low in overt violent behavior.

Some of the programs that deserve attention for thoughtfulness of approach are Dusty's Treehouse, Captain Kangaroo, Max-Be-Nimble, Arthur's Corner, Big Blue Marble, Hot Fudge and, of course, the ubiquitous Sesame Street

which has been increasingly striving to have longer sequences and more constructive social content in response to some of the research criticisms. Except for Mister Rogers and Sesame Street there has been little systematic research evaluating the effects of these programs on children's spontaneous play. Indeed there's a desperate need for much more predesigned children's programming and behavioral scientists can play an important part here by pretesting elements of the material to see if producer's intentions are actually comprehended by children and if hoped for stimulation of imaginative play or constructive social interactions follow a period of viewing. In one segment of Sesame Street the program introduced a group of deaf children who participated in various ways in the show. Because no explicit explanation was given for deafness on the show only one child out of a large group of preschoolers we were working with ever grasped the idea that the children portrayed on the TV screen could not hear anything.

There is, then, a key role for parents not only in monitoring what children are watching but in sharing some of the viewing experience, interpreting content, allaying fears, helping the child distinguish real from fantasy figures. Parents need some guidance in what to look for in programming, what elements to focus on, how to restrain their didactic tendencies from time to time and still play a teaching role. One mother proudly told us that she always watched a grisly monster film series with her four-year-old and then added in a puzzled voice that she didn't see why he was having nightmares. I don't think we can take for granted that parents will always be aware of the dangers of certain programming for the very young; they may have forgotten they were teenagers when they watched such shows.

If the parents or, in some cases, day care center workers who use television or other child care personnel are alerted they can use TV to teach important concepts such as size relationships, the beginnings of conservation, time relations and vocabulary usage. Dr. Margaret Smart and her colleagues at University of Southern California has been developing a series of sample kits to be used in conjunction with television programming for parents and children to work on materials related to Piagetian constructs. Dorothy Singer and I have worked out cognitive training materials that can be linked to television viewed jointly by parent or teacher and child and are trying them out with parent groups. A project developed by Gloria Kirschner in conjunction with the NBC network is designed to stimulate parent-child-teacher discussion groups built around carefully selected programming for junior high school levels. A series of studies by Friedlander (1975) and (Whetstone and Friedlander 1974; Friedlander, Wetstone and Scott 1974) have been laying the groundwork for systematic experimental research that can evaluate the cognitive effectiveness of programming and that might offer further clues for preparation of parent-training manuals in how to use the TV medium for cognitive development.

Efforts of this kind are just a drop in the bucket--the first feeble beginnings of what is needed. We clearly require a massive effort by educators and child care specialists to bring parents back into the educational process, talking to their children generally and about TV specifically. Kits and reading materials geared to what children watch on television and handled jointly by parents and children may begin to make the television-viewing a part of a more active process. Programs like the Toy Library

that bring cognitively-oriented playthings into the homes of the urban poor can begin to take advantage of television material to stimulate play if special materials are provided.

5. Imaginative play training as an alternative to TV

It remains a possibility that children who are already active in imaginative play as a source of pleasure and coping may not require as much TV or may be relatively immune to some of its more noxious influences. At least one study (Biblow 1973) suggested that imaginative children were more immune to the aggressive influence of violent TV even when they were aroused to anger before viewing. We lack solid data to spell out whether the other benefits of make-believe play in early childhood described above can counteract some of the pernicious influence of TV or at least insure that what is watched gets worked into constructive fantasy. Dorothy Singer and I (Singer and Singer 1977a,1977b,1977c) have developed a series of games, exercises and suggestions for parents or teachers designed to be used to sustain the level of imaginative play for children who have shown it early and to increase the level for children who show very little in their behavioral repertory. Although research makes it clear that training can be effective (Freyberg 1973; Smilansky 1968; Dansky 1976; Saltz 1976; Singer and Singer 1976a) the tie to changes in television behavior or influence has yet to be demonstrated. Our current research (Singer and Singer 1977b) may give some clues as we follow children whose parents have been trained in using these procedures over a period of time.

We come, then to the conclusion of our exploration of fantasy-land. Television is clearly a medium of enormous power. It pulls together for

for all of us but particularly for the very young those needs for make-believe, for the miniaturization of the strange and novel in our environment. It does so with, however, a serious risk to cognitive development. It preempts spontaneous play time and reading practice and may be creating a powerful appetite in the young for passive sensation-seeking rather than for the active cognitive restructuring and transformations that make play and reading seem so important. We need to explore through research just how valid and serious this asserted risk may be. At the same time we need a massive effort from educators and child care workers to alert parents and other caregivers to the necessity for monitoring TV-viewing frequency, for controlling program content to which preschoolers are exposed, for pressuring the commercial and public TV producers to increase the number of carefully-designed child-oriented programs and to evaluate them systematically. We need efforts to get parents into the arena to help children make sense of the TV experience and we need to help parents with materials and training on how to make even everyday television a useful cognitive or affective growth experience that can be tied to reading preparation or play.

Finally, we need to recognize that imaginative play is one of the most critical features of the growing child's behavioral repertory. It needs adult nurturing for it to be sustained in the preschooler and adults themselves need help in how to stimulate their children effectively for make-believe and pretend games. Fantasy play can be an active process tied closely to language skill development, conceptual growth and constructive social responsiveness. Television, if used wisely and moderately, can feed into such play just as parent-reading or story-telling can. It's touch and go at this point, I think. Either we make some effort to stimulate

active play in our children and to control the TV set or we might as well slump down together with the kids and a box of potato chips in front of the set and watch the parade pass us by.

References

Bettleheim, B. The Uses of Enchantment. New York: Random House, 1975.

Biblow, E. Imaginative play and the control of aggressive behavior. Chapter in J. L. Singer, The Child's world of make-believe. New York: Academic Press, 1973.

Branch, T. New frontiers in American philosophy. The New York Times Magazine, August 14, 1977, 12-22.

Coates, B. & Pusser, H. E. Positive reinforcement and punishment in Sesame Street and Mister Rogers. Journal of Broadcasting, 1975, 19, 143-151.

Dansky, J. L. Cognitive functions of sociodramatic play: A training study. Unpublished doctoral dissertation, Ohio Dominican College, 1976. Paper read at American Psychological Association meetings, Washington, D. C., 1976.

Dennis, L. B. Individual and familial correlates of children's fantasy play. Unpublished doctoral dissertation, University of Florida, 1976.

Fein, G. G. A transformational analysis of pretending. Developmental Psychology, 1975, 11, 291-296.

Freyberg, J. Increasing the imaginative play of urban disadvantaged kindergarten children through systematic training. Chapter in J. L. Singer (Ed.), The Child's world of make-believe, New York: Academic Press, 1973.

Friedlander, B. Z. Director, New England Instructional Television Research Center, List of Publications and memos, etc., 1975.

Friedlander, B. Z., Wetstone, H.S. and Scott, C.S. Suburban preschool children's comprehension of an age appropriate informational television program, 1974.

Friedrich, L. K. & Stein, A. H. Prosocial television and young children: The effects of verbal labeling and role playing on learning and behavior. Child Development, 1973, 46, 27-38.

Gerbner, G. Television and the family. Prix Jeunesse Seminar, Munich, West Germany, 1977.

Gershowitz, M. Fantasy behaviors of clinic-referred children in play encounters with college undergraduates. Unpublished doctoral dissertation. Michigan State University, 1974.

Gould, R. Child studies through fantasy. New York: Quadrangle Books, 1972.

Halpern, W. Turned-on toddlers, Journal of Communication, Autumn, 1975, 25, 66-70.

Hutt, C. The taxonomy of play. Pediatric Roundtable on play and learning. Johnson and Johnson Baby Products Company Symposium, New Orleans, La. March, 1977.

Izard, C. Human emotions. New York: Plenum, 1977.

Lefkowitz, M. M., Eron, L. D., Walder, L. O. & Huesmann, L. R. Growing up to be violent. New York: Pergamon, 1977.

Leibert, R. M., Neale, J. M. and Davidson, E. S. The early window: Effects of television on children and youth. Elmsford, New York: Pergamon Press, 1973.

Lesser, G. S. Children and television. New York: Random House, 1974.

Lewis, P. H. The relationship of sociodramatic play to various cognitive abilities in kindergarten children. Dissertation Abstracts International, 1973, 33, 6179 (Ohio State University).

Milkovich, M. and Miller, M. with Bettinghaus, E. and Atkin, C. Michigan State University. Effects of Television Advertising on Children - Exploring the relationship between television viewing and language development, Report #3, 1975.

Miller, G., Galanter, E. & Pribram, K. Plans and the structure of behavior. New York: Holt, 1960.

Nahme-Huang, L., Singer, D. G., Singer, J. L., & Wheaton A. Imaginative play and perceptual motor intervention methods with emotionally-disturbed, hospitalized children: An evaluation study. American Journal of Orthopsychiatry, 1977, 47, 238-249.

Paivio, A. Imagery and language. Chapter in S. Segal (Ed.), The Adaptive function of imagery. New York: Academic Press, 1971. Paper read at 3rd annual conference of the Center for Research in Cognition and Affect, City University of New York, 1970.

Piaget, J. Play, dreams and imitation in childhood. New York: Norton, 1962.

Rohwer, W. D., Jr. Images and pictures in children's learning: Research results and educational implications. Psychological Bulletin, 1970, 73, 393-403.

Rosenberg, B. Mental activity and environmental responsiveness: Optokinetic nystagmus during mental tasks associated with the left and right cerebral hemispheres. Unpublished doctoral dissertation,

Yale University, 1977.

Rubin, K. H., Maioni, T. L., & Hornung, M. Free play behaviors in middle and lower class preschoolers: Parten and Piaget revisited. Child Development, 1976, 47 (2), 414-419.

Saltz, E. Training for thematic-fantasy play in culturally-disadvantaged children. Annual report to the Spencer Foundation, Wayne State University, 1975-76.

Saltz, E. & Johnson, J. Training for thematic-fantasy play in culturally disadvantaged children: Preliminary results. Journal of Educational Psychology, 1974, 66, 623-630.

Shmukler, D. An investigation into some of the familial and home background correlates of imaginative play in children. Unpublished doctoral dissertation, University of Witwatersrang, Johannesburg, South Africa, 1977.

Segal, B. and Singer, J. L. Daydreaming, drug and alcohol use in college students: A factor analytic study, Addictive Behaviors, 1, 1976, 227-235. (a)

Segal, B. & Singer, J. L. Fantasy patterns in college drug and alcohol users. Summary progress report R01-DA-00590. National Institute of Drug Abuse, HEW, 1976. (b)

Singer, D. G., Caldeira, J. & Singer, J. L., The Effects of television-viewing and predisposition to imagination on the language of pre-school children. Paper presented Eastern Psychological Association, Boston, April 1977.

Singer, D. G. and Singer, J. L. Family television viewing habits and the spontaneous play of preschool children. American Journal of Orthopsychiatry, 1976, 46, 496-502.

Singer, D. G. and Singer, J. L. Partners in play, Harper and Row: New York, 1977.

Singer, D. G., Singer, J. L., Tower, R., & Biggs, A. Differential effects of television programming on preschoolers' cognition and play, Paper presented at the American Psychological Association, San Francisco, August, 1977.

Singer, J. L. Imagery and Daydreaming. In B. B. Wolman (Ed.), Handbook of general psychology. Englewood Cliffs, N. J.: Prentice Hall, 1973.

Singer, J. L. Imagination and make-believe play in early childhood. Some educational implications. Journal of Mental Imagery, 1977, 1, 127-144.

Singer. J. L. The power and limitations of television. A cognitive-affective analysis. Chapter in P. Tannenbaum (Ed.), Television as entertainment. Hillside, N. J.: Erlbaum, in press.

Singer, J. L., Greenberg, S., & Antrobus, J. S. (1971). Looking with the mind's eye: Experimental studies of ocular motility during daydreaming and mental arithmetic. Transactions of the New York Academy of Sciences, 33, 694-709.

Singer, J. L. and Singer, D. G. Fostering imaginative play in preschool children: Television and live model effects. Journal of Communications, 1976, 26, 74-80. (a)

Singer, J. L. and Singer, D. G. Imaginative play and pretending in early childhood. In A. Davis (Ed.), Child personality and psychopathology. (Vol. 3) New York: Wiley, 1976. (b)

Singer, J. L. and Singer, D. G. Creativity and Imaginative Play in the Preschool Child. Film strip series. New York: Parents Magazine Films, 1977. (a)

Singer, J. L. and Singer, D. G. Television viewing and imaginative play in pre-schoolers: NSF Grant Progress Report, 1977. (a)

Smilansky, S. The effects of sociodramatic play on disadvantaged preschool children. New York: Wiley, 1968.

Stein, A. H., Friedrich, L. K. & Vondracek, F. Television content and young children's behavior. In Television and Social Behavior (Vol. 2). J. P. Murray, E. P. Rubinstein & G. A. Comstock (Eds.) Washington, D.C.: U.S. Government Printing Office, 1972.

Sutton-Smith, B. Play, creativity, and moving. In E. Han and W. Preising (Eds.), Human Movement. Schorndoff Germany: Verlag Karl Hoffman 1976.

Tannenbaum, P. H. and Zillmann, D. Emotional arousal in the facilitation of aggression through communication. Advances in Experimental Social Psychology, 1975, 8, 149-192.

Terrace, H. S. & Bever, T. G. What might be learned from studying language in the chimpanzee? The importance of symbolizing oneself. Annals of The New York Academy of Sciences, 1976, 280, 579-588.

Tomkins, S.S. Affect, imagery, consciousness. Vols. I and II. New York: Springer, 1962, 1963.

Tomkins, S. S. A Theory of memory. In J. S. Antrobus (Ed.), Cognition and Affect. Boston: Little, Brown and Company, 1970.

Tucker, J. The role of fantasy in cognitive-affective functioning: Does reality make a difference in remembering? Unpublished doctoral dissertation, Teacher's College, Columbia University, 1975.

U. S. Commission on Civil Right, Window dressing on the set: women and minorities in television. A report of the U. S. Commission on Civil Rights, 1977.

Watt, J. H. and Krull, R. An examination of three models of television viewing and aggression. Human Communications Research, 1977, 3, 99-112.

Wetstone, H. S. and Friedlander, B. Z. The Effect of live, TV and audio story narration on primary grade children's listening comprehension, The Journal of Educational Research, Vol. 68, September, 1974,

Winfrey, C. Week without television tunes several families into different channels. New York Times, April 27, 1977.

Winn, M. The Plug-in drug: Television, Children and the Family. The Viking Press: New York, 1977.

Witelson, S. F. Sex and the single hemisphere: specialization of the right hemisphere for spatial processing. Science, 1976, 193, 425-427.